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Communications will be welcomed from any quarter. Abstracts of scientific papers are solicited, and twenty copies of the issue containing such will be mailed the author on request in advance. Rejected manuscripts will be returned to the authors only when the requisite amount of postage accompanies the manuscript. Whatever is intended for insertion must be authenticated by the name and address of the writer; not necessarily for publication, but as a guaranty of good faith. We do not hold ourselves responsible for any view or opinions expressed in the communications of our correspondents.

Attention is called to the "Wants" column. All are invited to use it in soliciting information or seeking new positions. The name and address of applicants should be given in full, so that answers will go direct to them. The "Exchange" column is likewise open.

PLAYING CARDS FROM JAPAN.

THE history of playing cards, their introduction into Europe from the East by the gypsies or by the home-returning Crusaders, the change and development they underwent while being adapted from the cards of the Orient and altered into those that are familiar to our eyes, have been dwelt upon by numbers of writers; but the cards used in Japan have not been mentioned in any of the best known histories, although they are more distinctly original than any others, and they show no marks of the common origin which the Italian, Spanish, German, French, Hindu, and Chinese cards display.

The Japanese cards, we learn from a paper by Mrs. J. King van Rensselaer, in the "Proceedings of the National Museum" (Vol. XIII, No. 836), are oblong, and are made of pasteboard. The backs are painted black, with none of the checkered dotted marks which usually decorate European cards. The designs seem to be stencilled, and are brightly and appropriately colored, and then covered with an enamel or varnish, which makes them quite as slippery as our own. They are very much smaller than our cards, being a little more than two inches long by one broad.

Forty-nine in number, they are divided into twelve suits of four cards in each suit. One card is a trifle smaller than the rest of the pack, and has a plain white face not embellished with any distinctive emblem, and this one is used as a "joker." The other cards are covered with designs that represent twelve flowers or other things appropriate to the weeks of the year. Each card is distinct and different from its fellows, even if bearing the same emblem, and they can be easily distinguished and classified, not only by the symbolic flowers they bear, but also by a character or letter that marks nearly every card, and which seems to denote the vegetable that represents the month. The only month that has no floral emblem is August, and that suit is marked by mountains and warm-looking skies.

January is represented by pine trees, which, on two of the cards, are shown against a lurid sky; the third one has a grayish background, that throws the trees into strong relief, and the fourth has a setting sun flecked with light clouds, the pines barely indicated in front of it, and the greater part of the card covered with the figure of a huge white-bodied, red-eyed stork.

February displays as its emblem a plum blossom, the four cards devoted to this month bearing its flower in various positions.

March has a red cherry blossom, and April the hanging tendrils of the wistaria vine. On one of the cards of this suit is a wee yellow-bird, which is flying across its surface under a crimson cloud.

For May there are beautiful blue iris springing from long spiky leaves. One card shows in one of its corners part of a dock or pier, and also the water, out of which the flower is lifting its lovely head.

June is represented by blood-red peonies, over one of which two yellow butterflies are hovering.

On July's cards star-shaped leaves, some yellow, some red, and some black, are scattered over their surfaces. These leaves resemble those of our gum or liquid amber trees, but they bear the Japanese name of *hägi*. On one of the cards belonging to this suit a deer is represented standing under the branches of this strangely-hued tree. This is the only figure which recalls in any way the emblems used on cards belonging to other nations, as on one of the Chinese cards is found either a deer or else Chinese characters which have been translated to mean "This is a deer."

August is represented by four pictures of grass-covered mountains, in three of which they are sharply defined against a clouded blue sky, and in the fourth the sun, looking hot and sultry, beams down on a treeless hill. Three birds fly across the sky on one of these cards.

September bears the Mikado's flower, a yellow and red chrysanthemum; October, a maple tree with red or yellow leaves; and on one card is a yellow boar trotting off towards the symbolic tree.

November shows on one of its cards a willow sharply outlined against a leaden sky. The willows on a fellow-card look wind-tossed, and a long-tailed bird skims across the sky. A third card is covered with inky clouds, torrents of rain, and strange zigzags resembling forked lightning. The fourth card of this suit bears a quaint figure of a man rushing through the storm under the willow trees and dropping his sandals in his haste, his head covered with a huge yellow umbrella. Streaks of lightning surround the little figure, and the storm of rain is well depicted in the picture.

December bears the imperial Japanese plant *kiri*, and over one of these flowers hovers a beautiful red-crested silver-winged pheasant.

An infinite variety of games are played with these cards, as there is a shade of difference in each one of each set, and in some games each has a separate value. The favorite game in Japan at present is very like cassino, in which any card of a set may take any other, but all have their own values in the final count.

HEMP CULTIVATION IN THE PHILIPPINE ISLANDS.

THE Manila hemp plant, which is very similar to the banana or plantain, thrives best in soil composed of decayed vegetable matter, the principal districts in the Philippine Islands in which it is cultivated being reclaimed forest land. The yield, according to Mr. Gollan, British consul at Manila, is more abundant on hilly land than on low-lying flat ground, and the volcanic nature of the soil of the islands seems to be particularly adapted to the growth of the plant. The production is chiefly in the southern districts, where the rainfall is greater than in the vicinity of Manila. The trees suffer severely from excessive heat and drought. The custom in the Philippines is, after clearing the land, to plant small plants of about three feet high, leaving a space of from two to three yards between, the young shoots which spring up later around the parent stems filling up the intervening space. The ground is carefully cleaned and weeded at least twice a year.

As a rule it takes about three years to produce a full crop, but in a favorable soil a crop of about one-third the full production would be available in two years after planting, the second crop the following year would yield about two-thirds, and by the fourth year a full crop would be obtained. The trees are ready for cutting when the first shoots begin to be thrown out. When the trees have matured and are ready for cutting, they are cut down about a foot from the ground, and layers are stripped off the trunk. These layers are then cut into strips about three inches in width. The strips are then drawn between a blunt knife and a board, to remove the vegetable matter from the fibre, which latter is placed in the sun to dry. As soon as it is thoroughly dried it is ready for the market.

The appearance and consequent value of the fibre depends mainly upon the care taken in drying it, as should it be exposed to rain and not completely dried, it becomes discolored, assumes a brownish tint, and loses its strength to a considerable extent. The outside layer produces a reddish-colored fibre, which is quite sound, and easily distinguishable from spoiled hemp, but fetches a lower price in the market.

The cost of preparing and planting a *quinon* (about seven acres), and keeping it clean up to the time of the first crop, is estimated at from two to three hundred dollars, not including the first cost of the land; and afterwards an annual outlay of about sixty dollars would be required to keep the soil free from weeds, etc. The extent of land mentioned, after the plantation is three years old, would produce from sixteen to twenty bales per annum, according to the quality of the soil.

Almost without exception, landowners who devote themselves to the production of hemp in the Philippine Islands are European Spaniards, or natives of the islands, and a foreigner would have considerable difficulty in establishing himself, and would meet with many obstacles before he found himself in touch with his surroundings. Foreigners can only own land in the Philippine Islands under the following conditions, which are strictly enforced: (1) That they reside in the Philippine Islands, and are duly registered in the books of their respective consulates and of the government. (2) That their lands be sold, should they leave the islands and establish their domicile elsewhere. (3) That, in the event of the death of a landed proprietor, his heirs be compelled to reside within the territory of the Philippine Islands, or sell the property. The acquisition of land by foreign companies or associations is absolutely prohibited.

The cost of native labor is about twenty or twenty-five cents a day; but the principle upon which the hemp plantations are worked is, that the laborer gets one half of the result of his work, the other half going to the proprietor. A laborer, under pressure, can clean about twenty pounds of hemp per day; but, as a rule, the quantity cleaned by one man, working steadily day by day, averages about twelve pounds. Many unsuccessful attempts have been made to improve upon the primitive knife and board, which are, up to the present, the only means used for cleaning the fibre. The great faults of the new inventions have been the weight of the machine, and the additional liability to break the fibre. A necessary requirement for any new machine which would replace the present method is, that it should be light enough to be easily carried about by the workmen from place to place on the plantation. The exports of hemp from the Philippine Islands, in 1890, amounted to 63,270 tons, which, at the average price for the year, realized about ten and a half million dollars.

THE ELECTROLYSIS OF ANIMAL TISSUES.

THE first number of "Studies from a Physiological Laboratory, Owen's College, Manchester," contains a paper by G. N. Stewart, which is an interesting contribution to our limited knowledge of the action of electricity in relation to animal tissues. From an abstract of this paper, which we find in a recent number of the London *Electrical Review*, it seems that practically the whole of the conduction in animal tissues is electrolytic, and the electrolytes are principally the mineral salts, changes in the proteids being produced by secondary electrolytic actions.

In simple proteid solutions, conduction occurs with great difficulty if mineral salts are absent, or if they are present only in small proportions. The effects on the proteids themselves in saline solutions vary somewhat with the current density. Alkali-albumin is formed at the cathode, and acid-albumin at the anode; while in solutions of coagulable proteids there is also coagulation at the latter pole. With a strong current, the proportion of coagulated proteid to acid-albumin is greater than with a weak current. In bile and urine it was observed that the conduction is also chiefly due to electrolysis in the mineral substances, and not in the organic substances contained in these secretions. In blood, the changes which take place in the proteids are similar to those which are mentioned above. There is also a formation of acid-hæmatine (mixed with or preceded by methæmoglobine with certain strengths of current) and of alkali-hæmatine at the anode and cathode, respectively. There is no evidence that hæmoglobine or any of its derivatives can act as an ion.

In muscle the nuclei become apparent and the sarcous substance granular at the anode; this is the appearance always produced by a weak acid. At the cathode the fibres become more homogeneous. The chief chemical changes in proteids are, an increase in the neutralization precipitate of the aqueous extract, and a corresponding decrease of the globuline. At the anode the neutralization precipitate is increased, but the amount of globuline is more than correspondingly diminished, because part of this proteid is coagulated. The effects of electrolysis on the salts of the muscles were studied by estimating the ash. Striking changes were found to occur, which, if produced within the living body, would profoundly modify nutrition. The antiseptic action of the current was studied in the case of micro-organisms, and it was found to occur chiefly, if not entirely, around the anode.

In another and later paper specially devoted to the electrolysis and putrefaction of bile, Mr Stewart shows that when bile is electrolyzed in a U tube, changes take place at the negative pole, which are similar to those which occur when bile is allowed to putrefy; that is, the pigment changes to brown through light shades, ultimately becoming yellow. In the early stages of the electrolysis a reversal of the current restores the original color. The anode has an oxidizing, the cathode a reducing, action upon bile. The bile salts are electrolytes, and an acid constituent of these crystallizes at the anode in long needles; but the conductivity of bile salts is small as compared with that of the inorganic constituents of the secretion.

With these results for bile we may compare those obtained by J. B. Haycraft and H. Scofield (Zeit. Physiol. Chem., xiv., 193). In the course of their researches they showed that a play of colors is obtained at the positive pole of a battery (four Grove cells) placed in the bile, indicating successive stages of oxidization: if the negative pole be then placed in the bile, the effects are reversed, indicating reduction.

Mr. Stewart makes some attempt to connect this knowledge of the electrolysis of animal tissues with the application of electrolysis in surgery, and promises a further communication on the physiological aspects of the question.

LETTERS TO THE EDITOR.

**** *Correspondents are requested to be as brief as possible. The writer's name is in all cases required as proof of good faith.*

The editor will be glad to publish any queries consonant with the character of the journal.

On request, twenty copies of the number containing his communication will be furnished free to any correspondent.

Osteological Notes.

IN my notes published in *Science*, Vol XVI., p. 332, upon the significance of the jugal arch, I stated that although this arch is often composed of three bones, this number was sometimes reduced to two, and in some cases rendered still more rudimentary, but that in no case could the arch be said to be absolutely wanting. Moreover, that the number of bones present, as well as the strength of the arch, depended upon the extent of surface, and upon the amount and form of curvature, and these, in turn, upon the advanced or receded position of the orbit, as also upon that of the articulation of the mandible, whether above, below, or upon a level with the orbital cavity. These also are correlated with the extent of surface presented by the ascending process of the lower jaw with the adjoining crests, processes, fossæ, with the dental series, and necessarily with the muscles of mastication.

I cited the *Carnivora* as presenting the most instructive example of the various points to be considered in connection with the morphology of the arch, every one of these having reference to enormous development and implying great strength and capacity.

I also cited certain of the *Edentata* as exhibiting the exactly opposite condition, —a rudimentary and incomplete arch, with consequent feeble muscular power, no necessity for mastication, and an entire absence of teeth.